

ARGELI

Edgeworthia gardeneri

Argeli (*Edgeworthia gardeneri*) is a fast growing shrub with a unique triangular branching pattern, found in the hills of Nepal. Its cultivation in Nepal could represent a potential income generation activity, since the Japanese government is likely to import substantial quantity of Argeli bark to compensate its shortage in Japanese Mitsumata (*Edgeworthia papyrifer*). The Japanese currency notes are partly made from the fibers of this plant (Maharjan, 1996).

1. BIOLOGY

A. Taxonomy

Family - Thymelaeaceae

Local Name - Argeli, Aryuili, Aryili, Locate, Kholepat

Japanese Name - Himalayan Mitsumata

English Name – Argeli

In Japanese language, Mitsumata means tri-forked, because it regularly branches three ways. The Japanese Mitsumata is a deciduous shrub, while Argeli is an evergreen (Maharjan, M. R., 1996). Argeli is a large much-branched shrub with long scrambling branches. The flowers of Argeli are small golden-yellow and sweet scented. The leaves are 7.5-12.5cm, hairless above, hairy or silky-haired beneath.



B. Habitat and Range

It is believed that the country of origin of the Mitsumata found in Japan is Nepal. Nevertheless the species found in both countries are different. Argeli grows naturally in the mid-hills region of Nepal at the altitude of 1800 - 2600m.

This species is found naturally in the following districts of Nepal: Dolakha, Ramechhap, Solukhumbu, Aokhaldhunga, Sankhuwasabha, Tehrathum, Ilam, Panchathar, Taplegunj, Kabrepalanchowk, Sindhupalchowk, Nuwakot, Magdhi, and Parbhat.

Argeli is found in Dolakha district in Bocha, Gaurishankar, Lamabhagar, Orang, Chilankha, Khapachagu, Bhighu, Jiri, Shayama, Mali, Thulopatal, Laduk, Bulung, Lapilang, Lamidada, Sailungeshowr, Dhudhapokhari, Katakuti, Magapouwa, Bhusapheda, Dadakharka, Lakuridada, Khare, Junghu, Suri, Chankhu, Kalenchowk, Jhakhu, Marbhu, and Kshamawoti VDCs.

C. Ecology

Argeli is an evergreen shrub of the Himalaya up to 3m. The flowering/fruiting season of Argeli is November to April. Argeli grows on north facing slopes, with moist, well-drained soil between 1500 and 2600m.

D. Regeneration

Natural regeneration of plants takes place by seeds, the seeds become mature with high potential of viability during July. Artificial regeneration (cultivation) of Argeli has started recently. Some demonstration plots of Argeli are planted in private lands of Jiri, Bhocha, Suri and Chankhu VDCs and in community forests of Bhocha, Suri, and Chankhu VDCs. Argeli can be cultivated by plant propagates and seeds brought from Japan through Kanpou- Nepal. These branches (plant propagates) are planted at spacing of 1 to 1.5 m during the month of May to July. Harvesting can be done after three years of growth.

2. RESOURCE MANAGEMENT

A. Management System

Argeli is mostly collected from government forests where there is no control over the collection. Argeli is not included in the Management Plan of the Community Forests of Janakpur and Koshi Zones.

B. Harvesting

Argeli plants are ready for harvesting after three years of plantation. Minimum height of 1.5 m and minimum circumference of stems is 7 – 11 cm are suitable for harvesting. A lot of small premature branches sprout from the stem of Argeli, so while harvesting precaution should be taken not to injure these premature branches and buds. Stems are cut with sharp knife with incline cutting portion, without splitting of stem about 5 cm from the ground level. Collection usually starts November onwards, although, after February is the appropriate time for harvesting which is after the seeds have been dropped. Argeli can be harvested until March. Stems cut during winter season have good quality and are safe from rotting. The cutting of stems during winter also facilitates sprouting during growing period from the beginning of monsoon season because in this period there are increased growing and production cells. If the stems are cut during rainy season then these may rot due to high moisture content. The old, diseased and over matured branches should be removed from the harvested plants. It is possible to harvest Argeli for

up to 25 years from one plant. In order to harvest sustainably for 20-25 years plants need yearly weeding and fertilization.

C. Sustainability Issues

Due to the high price of Argeli bark, collectors have high competition for collection and it is collected before maturation. Thus, unmanaged exploitation of Argeli has resulted in the decrease in natural production. According to the traders in the central and eastern parts of Nepal, natural production of Argeli is declining every year.

3. UTILIZATION

A. Subsistence

Traditionally in Nepal, Argeli is used for making ropes for the cattle and to carry loads and making fences for cultivated lands in the rural areas. Paper is made locally from the bark of this plant. Although, people prefer Lokta paper to Argeli because the quality is not as good, it is not as strong and the colour is yellow.

B. Commercial

White skin is extracted using steam debarking method from the Argeli stems and exported to Japan through Kanpou-Nepal where, it is converted to a high quality paper that is used for currency making and also for postal stamps and passports.

In the year of 2001, Kanpou-Nepal exported around 12 tons of crude steam barks of Argeli to Japan. Some Nepali paper industries mixed the Argeli pulps in Lokta's for papermaking.

4. MARKETING

A. Production and Volume Trade

This plant is collected from Dolakha district of Central development region and Tehrathum, Sankhuwasabha, Taplegunj districts of Eastern development region. This species can be cultivated in Dolakha, Ramechhap, Solukhumbhu, Aokhaldhunga, Sankhuwasabha, Tehrathum, Ilam, Panchathar, Taplegunj, Lalitpur, Kabrepalanchowk, Sindhupalchowk, Nuwakot, Magdhi, Parbat districts.

Mostly children, women and shepherds collect Argeli in their leisure time. In general, each household collects 14.5 kg/season in Chaite CFUGs of Tehrathum district, 125 kg/season in Okhare CFUGs and 42 kg/season in Kalika CFUGs of Sankhuwasabha district, but in Charnawati and Thanksa Deurali CFUGs, Lakuridada CFUGs and Deuralipakha and Pandit CFUGS of Dolakha district each household collects 300-400kg,

500-700 kg and 12.5-15 kg of Argeli bark respectively per season. The cash generated by selling of Argeli is used to buy food, clothes, salt etc.

According to Kanpou-Nepal's information, around 12 tons of crude steam Argeli barks is exported to Japan which are collected from following districts; Dolakha, Ramechhap, Sankhuwasabha, Tehrathum, Taplegunj, Ilam, Pachathar, Kabrepalanchowk, Sindhupalchowk, Lalitpur, Magdhi, and Solukhumbhu

According to DFO's information, around 13,285 kg of crude Argeli bark is traded from the Dolakha district the fiscal year 2058/059 (2001-2002)

Kanpou-Nepal will purchase Grade I Argeli for NRs 300/kg and Grade II for NRs 220/kg. For low Grade Argeli they will purchase for NRs 50-60/kg. Low Grade Argeli is either not steamed, the length of the bark is not appropriate or improperly cleaned.

B. Current Market Channel

Collector - > Village Trader -> Processor - > Exporter

Collector - > Village Trader - > Exporter

Collector - > Village Trader - > Regional trader - >Wholesaler - >Exporter

C. Current Processing Practices in Janakpur and Koshi

For production of white-skins of Argeli, the working sites need have shade, full sun expose, and near to reliable water source. The minimum size of temporary shade is length 6 m and breadth 4 m. One bench table needed for cleaning the black barks of Argeli.

Steaming method

Preparation of wooden box: The stems cut during winter season can not be debarked easily. In order to debark, stems are boiled in steam. A wooden box is needed with the dimensions of 2m x 1m x 1m for steaming 200 kg Argeli stems. Wooden planks are constructed to be airtight in order to reduce the loss of steam from leaks. Lids are also constructed to be airtight. In the bottom of the wooden box, one round hole is made to place an inlet pipe for steaming.

Preparation of stove: A stove is made for boiling water. Stove can be constructed by using the locally available materials such as stones or mud. The top portion of stove is made in a way to place kerosene drums for boiling water over the platform. In order to use kerosene cylinders as fuel, large burner is placed underneath of drum. Small holes are made in the top portion of stove to release the stove smoke.

Construction of joint between wooden box and drum: In order to inlet steam to wooden box from drum, one GI pipe is placed in between wooden box and drum. The joint is made airtight to prevent leakage of steam from the joint. In order to fill water in drum one small hole is made in the bottom portion of drum and GI pipe is fitted in it. For inletting

steam in wooden box, one hole is made in the top portion of drum, which is fitted with GI pipe.

Steaming method: Argeli stems are steamed as quickly as possible after harvesting to prevent loss of Moisture Content (MC). Stem bundles are tied with ropes inside wooden box for placing stems tightly. Lids are closed properly to check steam leakage during steaming period. Initially, 30-40 lit of water is put in drum, water begin to boil in 15-20 minutes after initiating burner. Stems are steamed for 3 hours. Fire is given continuously by stove burner in the same manner. It is possible to use firewood as fuel for boiling water, but more time is taken (3 ½ hrs). Shape and size of fire wood stove is also different from kerosene stove burner. Steam should not leak from wooden box during steaming process, in order to check release of steam paste of mud and cow-dung placed in joint between wooden planks. When steam start releasing from GI pipe, water is poured inside the drum at three times, 10 lit of water in each time. In this way, 70- 80 lit of water is consumed in one batch of steaming process. If the bark is removed easily by hand then it is done and ready for the debarking process.

For debarking, initially, barks are debarked from the bottom portion of stem, then one person catch bottom portion and other person pulled out bark from top portion of stem. This can be done by two people in case of individual stem or stems. First, we have to make bundles of half-debarked stems and then one person catch bundle properly and other person pulled barks individually from the top portion of stems for debarking bundles of stems. When heat is release from steamed Argeli bundles then Debarking of bundles is done. Cooling of bundles can be done in two ways; spraying cold water over steamed Argeli bundles or left the bundles to be cool for some time for preventing break/ split of barks. Debarking is done carefully; whole bark is removed up to top portion of stems. Bundles of barks are made according to length of barks. These steamed barks are called black barks.

Cleaning methods of black barks

Black barks are cleaned in two ways:

Soaking of black barks in water immediately after debarking: for cleaning of black barks these are soaked in water immediately after debarking. Bundles of black barks are put inside the water of river or large drum (inner portion of drum is polished with white enamel) for 5- 10 minutes. The soaked black barks are placed in shade place covered with jute or straw mattress. Black barks are cleaned individually after sometime.

Cleaning of black barks after sun drying: Black barks are placed in sun light for drying. The cleaning of black barks is done after sun drying. For cleaning of black barks, at first dried black barks are soaked in water for 10-12 hrs.

For cleaning soaked black barks either fresh or dried one; chepuwa (one tool made of wood) and small blade is needed. During cleaning of black barks, black portion at top of bark and remaining green portion beneath it removed properly.

Cleaning with the help of Chepuwa: Black barks can be cleaned with the help of Chepuwa. While cleaning, precaution should be taken not to break barks. Chepuwa is used lightly. Initially bottom portion of black barks is cleaned and then cleaning of top portion proceeds. Most portions of black barks are cleaned by chepuwa. Special precaution needs to be taken for cleaning top portion of barks as it should remain intact for trading not to be broken.

Cleaning with the help of small blade: Remaining unclean portion of black barks are further cleaned with the help of small blade. In order to proceed cleaning process, the barks are placed over table, which is covered with polythene sheet of tubes. For cleaning, small blade is placed lightly over barks in inclined position and pulled at own side by one hand and other portion of barks is pulled at either side by another hand. Over rubbing of cleaned barks is avoided. Tools used for process are cleaned properly and stored in dry place after finishing the cleaning process.

Small Bundle making process

Bundles are made according to size of cleaned Argeli barks. Bundles are made tightly so that barks not fall down during sun drying.

Drying process

Cleaned barks bundles are placed in sun light for drying. Bundles are hang in the bamboo poles, initially top portion of cleaned bark bundle is dried then the bottom portion. Bundles are dried properly in order to prevent from fungus infection. Drying process is not followed during snow-falling and non –sunny days for quality maintenance.

Rewashed the stored Argeli barks

Stored Argeli barks are rewashed by soaking in clean running water for ½ to 7 hours according to quality of barks. After this process, foreign materials are removed from barks and colour of bark is change into white. Bundles of barks completely remain inside the water. Inter place the barks bundles time to time so that remaining foreign materials wash away with running water. While removing the bark bundles from water, shake the bundles properly outside water to remove excess water and squeeze the bundles properly to remove the remaining water. Then the cleaned bark bundles are taken for sun drying.

Drying process

After rewashing the bark bundles in clean running river or stream, these are dried in the sun by placing them in erected bamboo poles frame. Initially, top portion are tighten in bamboo frame, when these portion are dried then bottom portion of bark bundles are dried. It is better to dry bark bundles not individual bark for easing large bundle making

process. Few days are needed for drying process so that bundles are kept inside the room in the evening. It is better to proceed soaking and drying process during full sunny days not in rainy/ snowy days. If we do these processes in cloudy or rainy days, barks are not dried so quality also degrades.

Re-inspection process

Re-inspection is done in drying places. Remaining dirt, outer black barks, black spots are removed with the help of small knife during re-inspection process. Special care should be taken during this process because this is the final cleaning of bark bundles before trading.

Bundles making process for trading

Bundles are made only after proper drying of Argeli barks. At this stage, it is necessary to make homogenous white skins bundles in term of shape and attractive colour because of trading purpose. While making bundles, it should weigh 2 kgs per bundle. Bottom portion of white-skins are placed at one side and top portion are bended at either side after reaching length of 120 cm. After bending top portion of white-skins, each bundle is banded in equal distance at three places. Argeli ropes are used for binding purpose. Avoid the knots, during binding instead of this just interlock the Argeli ropes. White-skins of same size are used for bundling, where longer one goes to A-grade and shorter goes to B, C, D grades according to length of them. Avoid mixing of white-skins of different sizes. Old, green/red/black spotted and short white-skins are separated during bundling process. These discarded ones are placed in the separate bundles.

Packaging process

After making small bundles (wt around 2 kg and length 120 cm) of white-skins, these are placed together to form around 30 kg wt large bundles. Large bundles are weighted to make them 30 kg, and 200 grams (allowance for loss of MC) added more in each large bundle. After weighting 3 kgs 200 grams, each bundle is taken in packaging frame where manual compression is given through pressing jugs. Before that, small bundles of white-skins are placed in large bundles in such a way that top portion of white-skins in one side and bottom portion in either side. After placing large bundle in packaging frame, top lid of packaging frame is placed on the top of large bundle, with the help of manual operated pressing machines, pressure is given from two sides (top and bottom) of frame. After getting bundles with height of 30-35 cm, pressing stopped. Each pressed bundle is banded at four places at equal distance. Argeli ropes are used for binding purpose. Avoid the knots, during binding instead of this just interlocked the Argeli ropes. Always use cleaned dried Argeli ropes for binding large bundle instead of unclean, spotted ropes. Size of the prepared bundles for trading length 120 cm, breadth 35 cm and height 35 cm.

Tools

Tools needed for steam processing of Argeli: Khukuri, stem thickness measuring tape, wooden box, MS drum, GI pipe, Kerosene cylinder (35-50 lit capacity), small blade/knife, chepuwa, scissors, plastic drum, bench table, weighting balance, bamboo, rice straw/ bamboo splits mattress, ropes, Galen, water proof cloth sheet, tent, temporary shade house, tyre-tubes sheet, table for bundling, packaging frame etc.

D. Variability and risk

Only some group or individual of community are befitted not other disadvantage members of community from the Argali production and processing programs of different agencies. Limited markets for this species decrease the scope. Only Kanpou-Nepal is exporting steam Argeli bark to Japan. Production is virtually stopped during the rainy season because of lacking of alternative drying process rather than sun drying, this make the production seasonal. Insufficient price and quality maintenance is done by concerning parties. Lacking of marketing research for searching market for Argeli.

5. SOCIO-ECONOMIC AND POLICY ISSUES

A. Socio-economic Factors of Existing Activities

Argeli is one of the important sources of income for rural people. Mostly disadvantaged people and farmers with low land holdings are involved in collection and trade of Argeli. The value of Argeli has increased, because of the high demand of steamed Argeli bark in Japan and local industries also making paper mixed with Argeli pulp.

B. HMG Policy on collection, processing, and trade

1. Current policy

Before collection, permit is required from the DFO but this is not done in practice. Usually, the traders attain collection permission before transporting to Kathmandu. To release Argeli from the district of origin to Kathmandu, trader must pay royalty of Rs. 5 per kg and get permit from DFO. If illegal Argeli is found, DFO is empowered to arrest, conduct search and initiate file case.

2. Policy constraints

Several unnecessary checkpoints from district up to the border are the main constraints, which are responsible for harassing the traders.

6. REFERENCES

Maharjan, M. R., 1996. Mitsumata- one of the potential Species for Income Generation in Community Forestry, CFA, NUKCFP (East), Nepal.